REMARKS

Claim objections

The Examiner has objected to claim 15 as unclear as to whether the claim intends to mean that the scavenging gas and the exterior scavenging gas are the same composition gas or if the scavenging gas flows over the exterior of the tube and becomes the scavenging gas. The present amendment clarifies that the two gases are simply of the same composition.

Prior art rejections

Independent Claim 5 and dependent claims 6 to 7, 9 to 13, 17, 20 to 21 have been rejected under 35 U.S.C. 103 as being unpatentable over Gänsicke et al. (U.S. Patent 6,516,636) in argued combination with Kyoto et al. (U.S. Patent 4,664,690) and Bartsch (DE 10332176 A1).

Dependent claims 8, 14 to 16, 18 are rejected based on further argued combination with Karbassiyoon et al. (U.S. Patent 4,632,684), Achener (U.S. Patent 3,907,536), Lebert et al. (U.S. Patent 5,026,413), Powers (U.S. Patent 4,165,223), DeLuca (U.S. Patent 3,933,454), and/or Freund (U.S. Patent 4,685,945).

Claim 5

Claim 5 as here amended recites a method for producing a tube of synthetic silica glass in a vertical drawing method. The method comprises supplying a silica glass mass continuously to a heating zone and softening the silica glass mass therein, and drawing a tube strand continuously off from a softened region of the silica glass mass. The tube strand has an inner bore therein, and a scavenging gas is circulated through the inner bore of the tube strand. A

silica glass tube is obtained by cutting the tube strand to length. The scavenging gas has a water content of less than 100 wtppb, and a front end of the tube strand distal to the softened region is closed by a flow obstacle that is permeable to the scavenging gas and that reduces flow of the scavenging gas flowing therethrough.

The claimed method is superior to prior art methods of making silica glass tubes, and is not suggested by the prior art. Reconsideration of the rejection is respectfully requested.

Gänsicke teaches a method for the manufacture of a quartz glass tube in a vertical drawing method in which a quartz glass hollow cylinder 5 is continuously supplied to a furnace 1 heating chamber 4. See Gänsicke, col. 1, lines 6-11. The hollow cylinder has an inner bore that is filled with an inert gas from a gas supply 10 that is provided at a pressure P1 that is lower than the pressure P2 in the heating chamber. During the drawing process, the gas supply system may be adjusted to change the pressure P1 of the inner bore of the tube 19 and the pressure P2 of the heating chamber.

In contrast to the scavenging gas recited in the present claim 5, Gänsicke teaches the use of an *inert* gas in the inner bore of the tube as well as the pressure P2 of the heating chamber. See Gänsicke, col. 2, lines 36 to 39. Gänsicke does not teach or suggest the use of a scavenging gas that circulates in the inner bore of the tube and prevents deposition of harmful contaminants on the inner wall of the tube.

Also, Gänsicke fails to mention the water content of the inert gas, in contrast to the method of claim 5, which recites using a scavenging gas that has a water content of less than 100 wtppb. Use of a scavenging gas with low water content in the claimed invention prevents the deposition of harmful hydroxyl ions into the silica glass of the inner tube wall. Gänsicke does not discuss water content or hydroxyl ion deposition.

In contrast to the permeable flow obstacle recited in claim 5, Gänsicke teaches only the use of a silicone plug 20 to seal the lower end of the hollow cylinder tube 18. Silicone plugs are impermeable, and the impermeability of the silicone plug is believed necessary to the control of the relative pressure differences in the Gänsicke system, i.e., internal pressure P1 is less than external pressure P2. See Gänsicke, col. 2, lines 40 to 43. The use in the present invention of a flow obstacle which is permeable to the scavenging gas provides for a continuous scavenging process by allowing flow of the scavenging gas out of the lower end of the tube. See current published application, US 2006/0191294 A1, para. 0026. At the same time, the flow obstacle limits the exiting gas flow, which reduces the cost of the method. Id. Gänsicke does not address any such flow of its inert gas, which by definition does not get depleted within the tube, but is apparently provided as an inert source of pressure in the tube.

Bartsch teaches a method of making glass bottles for food or medicinal purposes. See Bartsch, para. 0009. In the Bartsch method, a glass tube is oriented vertically in a carousel machine as shown in FIGS. 1 and 2, and the lower open end of the tube is heated by a flame 3. See Bartsch, para 0029. During this heating process, alkali borates in the glass evaporate and then precipitate on the inner surface of the glass tube, causing contamination. See Bartsch para 0029 and 0030.

Bartsch teaches two methods to prevent deposition of contaminants on the inner surface of the glass tube. The first method, as shown in FIG 1, involves just blowing air 4 through the tube, which rinses out any vaporized contaminants in the glass tube. See Bartsch, para. 0030. The second method of Bartsch, as shown in FIG 2, puts a stopper 5 with an opening in its center in the upper end of the glass tube. When the lower end of the glass tube is heated by the jet flame, the air expands and pressure builds in the glass tube. A part 4b of the heated expanding

air in the tube flows through the stopper 5, but another part 4a of the air in the tube forms a back pressure that prevents vaporized contaminants from contacting the inside of the glass tube. Bartsch, para. 0031.

In Bartsch, the gas in the tube is simply ambient air 6 that flows into the tube. Bartsch, para. 0031. Bartsch does not teach a method for drawing a tube, and it does not suggest a scavenging gas in the tube. The use of the stopper with a passage in Bartsch is solely intended to create a slight back pressure of air trapped in the tube, and the teaching of Bartsch does not admit to the argued combination with a tube drawing process where a gas is supplied to the interior of a tube. Furthermore, the advantages of the present invention, of continuous scavenging by the scavenging gas, coupled with a flow obstacle preventing unduly rapid loss of the scavenging gas, are completely foreign to the process disclosed in Bartsch.

Kyoto teaches a method for dehydrogenating an optical glass preform with the use of a halogen-containing gas. See Kyoto, col. 3 lines 5-6, col. 4 lines 58-63, col. 5 lines 62-63. The porous soot preform 1 (see FIG. 1) is supported on a rod 2 in a muffle tube 3. Halogen gas is supplied to flow through the tube 3. See Kyoto, col. 5, lines 41 to 46.

Kyoto is not directed to a tube drawing process, but simply to heating and dehydrogenating a globular porous preform. Kyoto does not teach or suggest that its halogen gas has low water content, and, in view of the porosity of the preform, a low water content is not a strict necessity, as the Examiner has suggested in the office action.

Moreover, Kyoto shows simply an unobstructed tube 3 through which the halogen gas flows without obstruction. Nothing in Kyoto suggests use of an obstacle to obstruct the flow of the halogen gas.

Kyoto therefore also fails to suggest the claimed invention.

The remaining cited references have been cited solely for their descriptions of elements found in dependent claims, and these references do not impact upon the allowability of claim 5.

Reconsideration of the rejection of claim 5 is therefore respectfully requested.

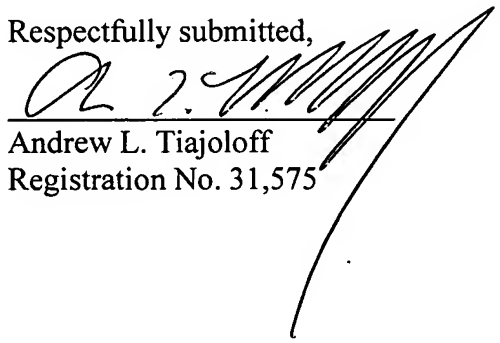
Dependent claims

The remaining pending claims, claims 6 to 18, 20 and 21, depend directly or indirectly from allowable claim 5, and therefore distinguish therewith over the cited prior art.

All claims having been shown to distinguish over the prior art in structure, function and result, formal allowance is respectfully requested.

Should any questions arise, the Examiner is invited to telephone attorney for applicants at 212-490-3285.

Respectfully submitted,



Andrew L. Tiajoloff
Registration No. 31,575

Tiajoloff & Kelly LLP
Chrysler Building, 37th floor
405 Lexington Avenue
New York, NY 10174

tel. 212-490-3285
fax 212-490-3295